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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/692,002

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EXAMINER

LIN, JERRY

ART UNIT

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1631

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DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/692,002	Applicant(s) WEST ET AL.	
	Examiner JERRY LIN	Art Unit 1631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 September 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 18-29 is/are pending in the application.
- 4a) Of the above claim(s) 19-23 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 18 and 24-26 is/are rejected.
- 7) ☒ Claim(s) 27-29 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Applicants' arguments, filed September 29, 2008, have been fully considered and they are deemed to be persuasive. However, in light of the amendments, the following rejections are deemed necessary. The following rejections and/or objections are newly applied. They constitute the complete set presently being applied to the instant application.

Status of the Claims

Claims 18 and 24-29 are under examination.

Claims 19-23 are withdrawn.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

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not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 18, 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Buntine (Statistics and Computing (1992) Volume 2, pages 63-73) in view of Veer et al. (Nature (January 2002) Volume 415, pages 530-536) in view of West et al. (PNAS (September 2001) Volume 96, number 20, pages 11462-11467).

The instant claims are drawn to a computer system with an processor, an input, an output, and a computer readable storage medium that generates a tree model using Bayesian analysis where the tree model comprises one or more nodes representing metagenes predictive of lymph node metastasis and one or more nodes representing risk factors, where the metagenes are generated by clustering expression data and extracting singular dominant factor from each cluster using singular value decomposition, generating a predicted disease outcome, and displaying the outcome.

Regarding claim 18, Buntine teaches a computer (which would include a processor, input, output, and computer readable storage medium) with a general classification tree model with Bayesian analysis for the statistical prediction of binary outcomes (abstract; page 63) where binary outcome is a clinical state, physiological state, a physical state, disease state, or a risk group (for example, pregnant or not pregnant in Figure 1) (page 63, right column; Figure 1); where the data is biological data

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(i.e. medical data) (page 63, right column; Figure 1; page 66, left column 2nd full paragraph from the bottom).

However, Buntine does not teach where the tree model has one or more nodes representing metagenes predictive of lymph node metastasis.

Regarding claim 18, Veer et al. teach using data representing metagenes (the expression patterns of a set of genes) predictive of lymph node metastasis in a classification scheme to predict clinical outcomes (pages 531-533), and where the predicted disease outcome is displayed on output (page 534, right column-page 535, left column).

However, neither Buntine nor Veer et al. teach where the metagenes are generated by sorting gene expression data into a plurality of clusters and extracting a singular dominant factor from each cluster using singular value decomposition.

Regarding claim 18, West et al. teach where sets of genes (metagenes) are clustered and a singular dominant factor (i.e. supergene factor) is extracted using singular value decomposition (page 11463).

Regarding claims 24 and 25, Veer et al teach where the clinical risk factor is hormone receptor status (page 530, right column; page 534, right column) and an outcome is tumor recurrence (e.g. prognosis of recurring tumors) (page 534, left column).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the methods of Buntine, Veer et al., and West et al. to improve the tree of Buntine. Buntine teaches a generic method of generating a classification tree

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model with Bayesian analysis. According to Buntine, his method may be used for a variety of different types of data, including biological data. Veer et al. teaches that using metagene expression pattern data improves the prediction of clinical outcomes of breast cancer. West et al. provide a method that further defines tumor cell phenotypes with greater precision. One of ordinary skill in the art would have been motivated to use the metagene expression pattern data of Veer et al. and the analysis West et al. as the biological data in Buntine's classification tree model to gain the advantage of improving prediction as well as improving precision. Thus, the claim would have been obvious because the substitution of one known element for another would have yield predictable results to one of ordinary skill in the art at the time of the invention.

Response to Arguments

4. Applicants have responded to this rejection by amending the claims and stating that neither Veer et al. nor Buntine teach the new limitation of where metagenes are generated by sorting expression data into a plurality of clusters and extracting singular dominate factor from each cluster using singular value decomposition. The Examiner agrees and has supplied West et al. to address this new limitation.

This rejection is necessitated by amendment.

5. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Buntine (Statistics and Computing (1992) Volume 2, pages 63-73) in view of Veer et al. (Nature (January 2002) Volume 415, pages 530-536) in view of West et al. (PNAS (September 2001) Volume 96, number 20, pages 11462-11467) as applied to claims 18, 24, and 25

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above, and further in view of Raychaudhuri et al. (Trends in Biotechnology (May 2001) Volume 19, number 5, pages 189-193).

The instant claim is drawn to a computer system with an processor, an input, an output, and a computer readable storage medium that generates a tree model using Bayesian analysis where the tree model comprises one or more nodes representing metagenes predictive of lymph node metastasis and one or more nodes representing risk factors, where the metagenes are generated by clustering expression data and extracting singular dominant factor from each cluster using singular value decomposition, generating a predicted disease outcome, and displaying the outcome. In particular the instant claim is drawn to where the clustering method is k-means clustering.

Buntine, Veer et al., and West et al. are applied as above.

However, Buntine, Veer et al., and West et al. do not teach k-means clustering.

Raychaudhuri et al. teach k-means clustering as an alternative method of clustering (page 190).

It would have been obvious for one of ordinary skill in the art at the time of the invention to substitute k-means clustering for clustering taught by Buntine, Veer et al., and West et al. Raychaudhuri et al. teaches that there are many well known methods of clustering gene expression data (abstract). Furthermore, after clustering, singular value decomposition is used to reduce dimensions and prune uninformative features (page 192). Thus, one of ordinary skill in the art can readily substitute the clustering means taught by Buntine, Veer et al., and West et al. with the k-means clustering. The claim

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would have been obvious because the substitution of one known element for another would have yield predictable results to one of ordinary skill in the art at the time of the invention.

Withdrawn Rejections

6. Applicant's arguments and amendments, filed September 29, 2008, with respect to the rejections made under 35 U.S.C. §112 2nd paragraph, 101, and 103 in view of Buntine and Veer et al. have been fully considered and are persuasive. The amendments are sufficient to overcome these rejections. These rejections have been withdrawn.

Allowable Subject Matter

Claims 27-29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JERRY LIN whose telephone number is (571)272-2561. The examiner can normally be reached on 7:00-5:30pm, M-TH.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marjorie A. Moran can be reached on (571) 272-0720. The fax phone

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number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jerry Lin/
Examiner, Art Unit 1631
1/2/08